

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.





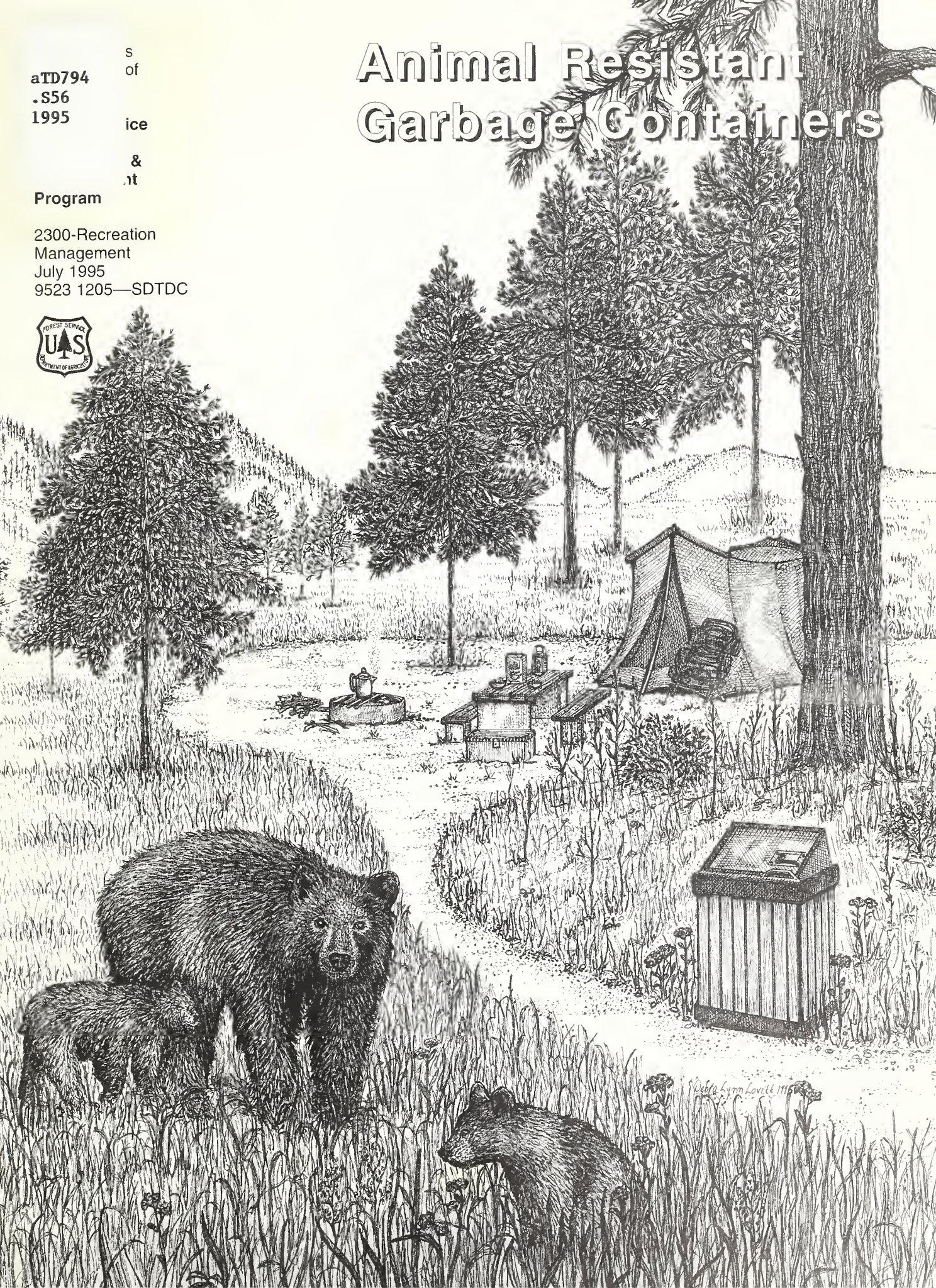
aTD794  
.S56  
1995

s  
of  
  
ice  
  
&  
nt

# Animal Resistant Garbage Containers

Program

2300-Recreation  
Management  
July 1995  
9523 1205—SDTDC



Debra Lynn Lovitt 1995



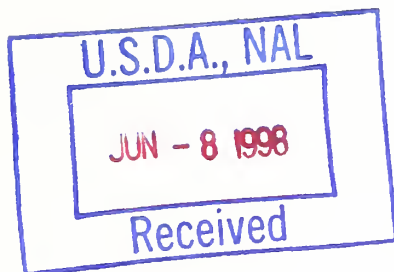
United States  
Department of  
Agriculture



**National Agricultural Library**

D794  
'556  
1005

# ANIMAL RESISTANT GARBAGE CONTAINERS



*By Lester Sinclair, Landscape Architect*

*San Dimas Technology & Development Center  
San Dimas, California*

July 1995

Special thanks to:

Mr. Harold H. Werner,  
Fish and Wildlife Biologist  
Kings Canyon National Park  
U.S. Department of the Interior  
for his professional expertise and editing support.

---

Information contained in this document has been developed for the guidance of employees of the Forest Service, USDA, its contractors, and its cooperating Federal and State agencies. The Department of Agriculture assumes no responsibility for the interpretation or use of this information by other than its own employees. The use of trade, firm, or corporation names is for the information and convenience of the reader. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval of any product or service to the exclusion of others that may be suitable.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications at 202-720-5881 or 202-720-7808 (TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, DC 20250 or call 202-720-7327 (voice) or 202-720-1127 (TDD). USDA is an equal employment opportunity employer.

## TABLE OF CONTENTS

---

|   |           |
|---|-----------|
| <b>BACKGROUND .....</b>   | <b>1</b>  |
| What Causes Garbage Container Animal Disturbance Problems? .....  | 2         |
| Feeding Wildlife Unintentionally! .....                           | 2         |
| Visual and Health Concerns .....                                  | 3         |
| Keeping Animals Out! .....  | 3         |
| Making Containers Easy to Use for Everyone! .....                 | 4         |
| Bear Problems .....   | 4         |
| <b>MOST COMMON CAN TYPE GARBAGE CONTAINERS IN USE TODAY .....</b> | <b>5</b>  |
| 32 Gallon (121L) Garbage Can .....                                | 5         |
| Tote Containers .....   | 5         |
| 55 Gallon (208L) Steel Drums .....                                | 6         |
| Miscellaneous Containers .....                                    | 7         |
| <b>DUMPSTERS IN USE TODAY .....</b>                               | <b>8</b>  |
| Front-Load Dumpsters .....  | 8         |
| Rear-Load Dumpsters .....   | 9         |
| Side-Load Dumpsters .....   | 10        |
| <b>ACCESSIBILITY .....</b>  | <b>11</b> |
| Height and Reach Limits .....                                     | 11        |
| Operating Mechanisms .....  | 12        |
| Exceptions to Design Guide Directions .....                       | 12        |
| Exposed Surfaces .....  | 13        |
| Clear Ground Space .....  | 13        |
| Dumpsters .....   | 13        |
| <b>ANIMAL RESISTANCE IN WASTE CONTAINERS .....</b>                | <b>15</b> |
| Criteria for Selecting an Animal-Proof Garbage Container .....    | 15        |
| Container Security .....  | 15        |
| Weatherproof Lids .....   | 17        |
| Latches .....   | 17        |
| Hinges .....  | 18        |
| Waste Container Fabrication Materials .....                       | 18        |
| Finishes .....  | 18        |
| <b>SELECTION AND COST .....</b>                                   | <b>19</b> |
| Can Type Bear-Proof Garbage Containers .....                      | 19        |
| Small Animal-Proof Container/Recycling System .....               | 21        |
| Bear-Proof Dumpsters .....  | 24        |
| <b>SUMMARY .....</b>  | <b>29</b> |
| <b>LIST OF MANUFACTURERS .....</b>                                | <b>30</b> |

**FIGURE LIST**

Figure 1. Unsecured 32 gallon (120 L) garbage container in a campground. .... 2

Figure 2. A black bear feeding on picnic table scraps ..... 2

Figure 3. Typical 32 gallon (120 L) garbage containers. .... 3

Figure 4. A black bear hunting for food. .... 3

Figure 5. Graphic sketch of bear with cubs. .... 4

Figure 6. Standard 32 gallon (120 L) galvanized steel container. .... 5

Figure 7. Rear-loader trash truck with a mechanical lift,  
courtesy of Shaeffer Systems Int. Ltd. .... 6

Figure 8. Multi-tote side-loading trash truck,  
courtesy of Shaeffer Systems Int. Ltd. .... 6

Figure 9. Zarn system “Z” plastic garbage containers, courtesy of Zarn, Inc. .... 6

Figure 10. A typical 55 gallon (210 L) steel drum garbage container. .... 7

Figure 11. 32 gallon (120 L) size, Hid-A-Bag Mini, uses a standard bag,  
courtesy of McClintock Fabricators, Inc. .... 7

Figure 12. 130 gallon (490 L) Hid-A-Bag II,  
courtesy of McClintock Fabricators, Inc. .... 7

Figure 13. 32 gallon (120 L) Hyd-A-Bag H/A,  
courtesy of McClintock Fabricators, Inc. .... 7

Figure 14. Four-in-One steel container system, Cibola NF. .... 7

Figure 15. 3 cubic yard (2.3 m³) container with plastic lid,  
courtesy of Capital Industries, Inc. .... 8

Figure 16. 8 cubic yard (6 m³) cathedral with skids,  
courtesy of Capital Industries, Inc. .... 8

Figure 17. XHD high compaction front loader, courtesy of Dempster Co. .... 8

## FIGURE LIST

|   |    |
|---|----|
| Figure 18. 2 cubic yard (1.5 m <sup>3</sup> ) dumpster/plastic lid. ....  | 9  |
| Figure 19. 3 cubic yard (2.3 m <sup>3</sup> ) slope-front container,<br>courtesy of Capital Industries, Inc. ....                     | 9  |
| Figure 20. 1 cubic yard (0.8 m <sup>3</sup> ) rear-load dumpster,<br>courtesy of Cubic Container Mfg. ....                            | 9  |
| Figure 21. Rear-loader, FS ....   | 9  |
| Figure 22. 1.5 cubic yard (1.1 m <sup>3</sup> ) side-load, flat-top container with<br>a metal lid by Capital Industries, Inc. ....    | 10 |
| Figure 23. 4 cubic yard (3 m <sup>3</sup> ) side-load, slope-top with self-closing doors,<br>courtesy of McClintock/Haul-All. ....    | 10 |
| Figure 24. 3 cubic yard (2.3 m <sup>3</sup> ) side-load, slope-front container<br>with a plastic lid by Capital Industries, Inc. .... | 10 |
| Figure 25. Semi-automatic garbage truck and dumpster collection system,<br>courtesy of McClintock/Haul-All. ....                      | 11 |
| Figure 26. Height limits. ....  | 11 |
| Figure 27. Box type gravity latch. ....   | 12 |
| Figure 28. Clear space for access. ....   | 13 |
| Figure 29. 32 gallon (120 L) container with a bear-proof lid on a concrete pad. ....  | 16 |
| Figure 30. Chain tie down loop. ....  | 16 |
| Figure 31. Weather resistant container. ....  | 17 |
| Figure 32. Box type latch. ....   | 17 |
| Figure 33. Paddle type spring-loaded lockable latch. ....   | 18 |
| Figure 34. Box type latch with bear-claw guard, McClintock Metal Fabricators. ....  | 18 |
| Figure 35. Lockable paddle handle slam latch. ....  | 18 |



**FIGURE LIST**

Figure 36. NPS bear-proof lid on 32 gallon (120 L) container. .... 19

Figure 37. Hid-A-Bag Mini 32 gallon (120 L) Model HB1G (\$550)  
courtesy of McClintock Fabricators, Inc. .... 20

Figure 38. Hyd-A-Bag H/A (\$710), courtesy of McClintock Fabricators, Inc. .... 20

Figure 39. Hyd-A-Bag Model HB2GU accessible animal-proof container for  
2-32 gallon (2-120 L) bags, courtesy of McClintock Fabricators, Inc. .... 20

Figure 40. Tioga-32 gal (120 L) courtesy of McClintock—call for current pricing ..... 20

Figure 41. SDTDC 32 gallon (120 L) heavy duty bear-proof lid,  
test model at Sequoia NF. .... 21

Figure 42. SDTDC 32 gallon (120 L) Cloverleaf System,  
one of three containers on a central stand with latch or no latch option,  
(currently for small animals only). .... 21

Figure 43. Cloverleaf Garbage Container System  
with stainless slam paddle latches and recycling capability. .... 22

Figure 44. CAD drawing of the Cloverleaf Garbage Container System. .... 23

Figure 45. 1.5 cubic yard (1.1 m³) rear-load bear-proof container.  
Manufactured by Cubic Container for SDTDC. Experimental model,  
front view, container has small self-latching doors on a cover lid. .... 24

Figure 46. 1.5 cubic yard (1.1 m³) container, rear view with lockable top  
and rings at the base for locking to a tie down. .... 24

Figure 47. 4 cubic yard (3 m³) bear-proof front-end load  
garbage container by Cubic Container Manufacturing  
for SDTDC, experimental model. .... 25

Figure 48. Front-load bear-proof dumpster  
with mailbox design top, Yosemite NP by Capital Industries, Inc. .... 25

Figure 49. Front-load container with bear-proof lid by Capital Industries, Inc. .... 25

Figure 50. Rear-load container with a bear-proof lid by Capital Industries, Inc. .... 25

**FIGURE & TABLE LIST**

---

Figure 51. ‘Lodal’ Bear-Proof containers by Capital Industries, Inc. .... 27

Figure 52. 4 cubic yard (3 m³) Hyd-A-Way bear-proof container  
with a self closing door, courtesy of McClintock/Haul-All. .... 27

Figure 53. Hyd-A-Way being emptied into hauling truck  
with a hydraulic lift, courtesy of McClintock/Haul-All. .... 27

Figure 54. Custom bear-proof dumpster lids from McClintock Fabricators, Inc. .... 28

**TABLES**

Table 1. Capacity and price list for rear-load bear-proof containers  
by Capital Industries, Inc. .... 26

Table 2. Capacity options and prices for ‘Lodal’ containers  
by Capital Industries, Inc. (See figure 51 for example). .... 26

## **BACKGROUND**

**National Forests nationwide continue to experience disturbance problems with waste containers that are not animal resistant. Solid waste management at forest recreation sites is a serious challenge for facility managers where bears, small mammals, and birds have easy access to open garbage containers. Animal disturbance of waste containers often occurs in recreation use areas where there is an overlap of man's activities within established wildlife habitats. Conflict also arises when there is an overlap of uses by humans and wildlife along the interface fringes between towns and wild areas, especially communities that offer recreational activities.**



## What Causes Garbage Container Animal Disturbance Problems?

The very nature of providing a user-friendly recreation facility with proper amenities for visitor use contributes to animal disturbance problems. Most garbage containers are located in open areas that are easy to access by the forest visitor, and just as easy to reach by the animals that live close to the recreation facilities. Also, many garbage containers currently used have unattached lids that can bend easily and dent, making it very difficult for the user to replace a lid on a garbage can. Often, open containers are not restrained, fenced off, or enclosed to prevent disturbance by animals in the area. As a result many recreation areas with open and movable containers may end up with scattered garbage over a widespread area (see figure 1).

Containers that have no restraining posts, chains, or cables to prevent the container from being knocked over or moved will encourage vandalism and disturbance by animals. Larger animals may tip or dump containers making it easy for insects, birds, and other small animals to gain access to garbage.

## Feeding Wildlife Unintentionally!

Wildlife can develop a taste for eating garbage from open containers that will eventually lead to an unbreakable habit and continued problems in the future. Maintenance also increases because of the time required to clean strewn trash on recreation sites. Animal-resistant garbage containers can reduce conflicts by discouraging the unintentional feeding of wildlife with open garbage containers (see figure 2).



*Figure 1. Unsecured 32 gallon(120 L) garbage container in a campground.*



*Figure 2. A black bear feeding on picnic table scraps.*

## Visual and Health Concerns

Scattered garbage is also a temporary visual eyesore that may discourage use by visitors, or render one or more campsites unusable. Where garbage has been scattered overnight, health concerns arise from having contaminated food and food packaging spread out on a recreation site. Strewn trash can draw bees, wasps, flies, ants and other insects to a site. The result can be as minor as general annoyance for the recreation user; or more serious, being stung. Birds scatter the garbage over a large area causing odor and visual problems. Rodents including mice, rats, and squirrels are a more serious problem because many of these small rodents are hosts to ticks (*Ixodes species*) and fleas that may be infected with the bacteria that causes Lyme disease (*Borrelia burgdorferi*) and bubonic plague (*Yersinia pestis*) (see figure 3).



Figure 3. Typical 32 gallon (120 L) garbage containers.

## Keeping Animals Out!

Animal resistance means containers that can withstand attempts by wildlife to tear, pry, or open waste containers with their claws, teeth and body weight. Containers should include lids that are self latching and attached to the garbage containers instead of separate components. Securing the container in a way that the container cannot be knocked over and spill garbage is also important. This can be achieved with the use of a post or an anchor to restrain and stabilize the garbage container. Increased use of animal resistant waste containers can also reduce the potential conflict visitors can encounter on recreational facilities with wildlife by eliminating the lure of free access to garbage (see figure 4).



Figure 4. A black bear hunting for food.





---

## Making Containers Easy To Use For Everyone!

The use of garbage containers by the Forest Service also includes the question of universal design. Commercially available standard garbage cans and dumpsters are often not functionally accessible for persons with disabilities. Many lids are difficult to open, others are difficult to use with one hand and still others are too tall for wheelchair users. Some key accessibility standards and exceptions will be discussed later in this report.

## Bear Problems

Bears, primarily the North American black bear (*Ursus americanus*), have always been a problem at recreation sites in all types of recreation areas. With the bears natural range covering many parts of the western, northern, eastern, and southern states, and Alaska and Canada, the black bear population has increased in recent years. With a higher black bear population, and an increase in numbers of visitors to the National Forests, there is also an increase in garbage container disturbance problems.

In addition to the black bear problem, there are clear signs that the brown (grizzly) bear (*Ursus horribilis*) will require careful bear-proof planning for existing and future recreation sites.

Typically bears will look for food anytime during the day or night. Once conditioned to foraging for human food, bears will visit a developed area routinely and often they will panhandle. This increases the potential for contact with the public. Open containers allow bears to feed on garbage, thereby encouraging the animals to forage in recreation sites. Allowing bears to scavenge and feed on campground garbage can lead to potential physical injuries for the bears and to visitors. Without some type of deterrence, bears will develop a regular pattern of feeding on garbage; other bears will learn to do the same, thereby ensuring similar scavenging habits. Also, scavenging on garbage can lead to ingestion of glass, plastics, and other potentially harmful substances that may result in bear health problems.

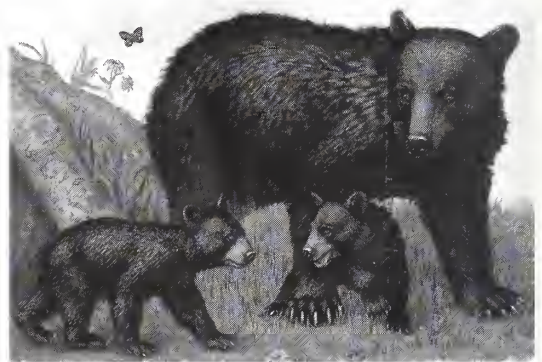


Figure 5.

The best way to end the bear-garbage-scavenging cycle is to replace open garbage containers with bear-proof garbage containers. This usually means using specially designed bear-proof containers that keep bears out! Once bears are discouraged from feeding on garbage with bear-proof containers, they will usually move on and look elsewhere for food. For persistent bears that refuse to give up garbage can raiding, the alternatives may be limited. In the worst cases, there will be a need to destroy bears to ensure safe recreation facilities for visitors (see figure 5).



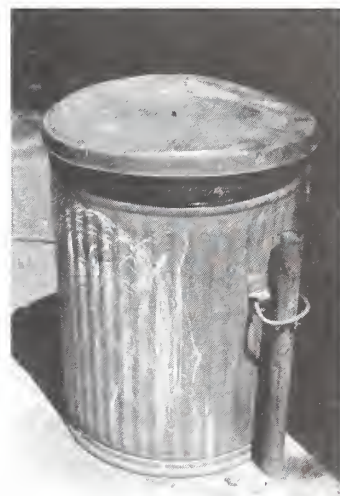
---

## MOST COMMON CAN TYPE GARBAGE CONTAINERS IN USE TODAY

Containers currently used in recreation sites vary in sizes from the standard GSA 32 gallon (120 L) container to 55 gallon (210 L) recycled steel drums. Most of these containers are available through the open market and through GSA. Generally, the most commonly used garbage cans sold through GSA and the open markets do not adequately meet the need for animal resistance. Separate lids, or no lids, limit the effectiveness of the containers to provide any protection against animal disturbance.

### 32 Gallon (120 L) Steel Garbage Can

The standard 32 gallon (120 L) galvanized steel garbage containers come with two lift handles. Lids are purchased separately, (see figure 6). The standard 32 gallon (120 L) garbage cans are accessible to people if left open and located along an accessible route. The standard lid, if seated properly on the can, generally renders the container inaccessible to many people because it requires grasping, excessive force, and is awkward for wheelchair users to remove. This condition worsens as the container or lid becomes deformed with continued use. Plastic garbage bags folded over the lip of the container add to the problem by creating a vacuum effect. Also used in many areas are the same 32 gallon (120 L) plastic garbage container commonly used in residential neighborhoods. Plastic containers work well when sheltered from the elements in an enclosed roofed structure.



*Figure 6. Standard 32 gallon (120 L) galvanized steel container.*

### Tote Containers

Plastic tote containers in 38 gallon to 101 gallon (140 L - 382 L) sizes are becoming the standard in many communities. Mechanical arms lift totes with hooks located on the front, back, or side of the garbage truck, requiring little or no hand labor. In many cases the operator does not have to leave the vehicle, increasing the efficiency of pick-up and disposal. Plastic containers work well for field garbage collection in areas where animals and vandalism are not a problem.

Totes have lids attached with a heavy duty hinge to withstand the punishment of being lifted and dumped by the garbage truck mechanical arms. The lids help to keep out insects, birds, and small mammals. The lightweight construction of the lids can accommodate universal access and provide a weather-tight cover. However, to ensure universal access, the unit should not be more than 36 inches (0.9 m) in height.

Most of today's plastic totes are injection molded polyethylene for both the container and the lid. To meet the needs of a wide variety of recreation sites totes are available in various



colors and textures. Totes are also easily maintained and dent-proof due to the inherent memory characteristics of plastic. Wheels on the units allow maintenance personnel to move the totes with ease. Larger capacity units are available for use in a variety of sites (see figures 7, 8, and 9).

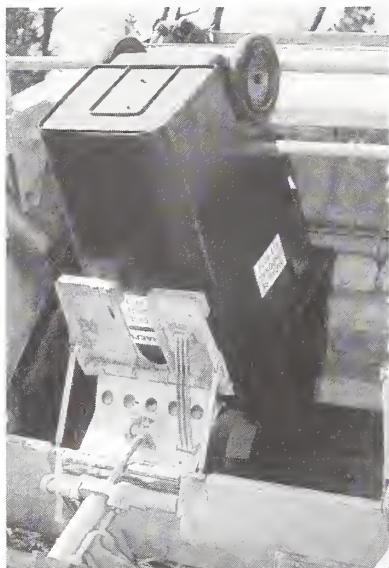


Figure 7.  
Rear-loader trash truck with a  
mechanical lift, courtesy of  
Shaeffer Systems Int. Ltd.



Figure 8. Multi-tote side-loading trash truck,  
courtesy of Shaeffer Systems Int. Ltd.

Some manufacturers are selling galvanized steel totes for use where fire vandalism is a problem. Consider weight and the denting when selecting a steel tote.

Totes may offer an alternative for urban forest recreation sites that are close enough to have a local contractor pick up garbage.

### 55 Gallon (210 L) Steel Drums

Steel drums usually with a capacity of 55 gallons (210 L) are commonly used in many recreation areas. The majority of the recycled steel drums have outlived other industrial uses and are re-used as garbage containers. Most of the time, recycled steel drums make acceptable garbage containers when painted and placed on a concrete pad and cabled or chained to a post or anchor in places of vandalism (see figure 10).



Figure 9. Zarn system "Z" plastic  
garbage containers, courtesy of Zarn, Inc.



## Miscellaneous Containers

The following containers are less common but are in regular use in a variety of recreation sites (see figures 11, 12, 13, and 14).



Figure 10. A typical 55 gallon (210 L) steel drum garbage container.



Figure 11. 32 gallon (120 L) size, Hid-A-Bag Mini, uses a standard bag, courtesy of McClintock Fabricators, Inc.

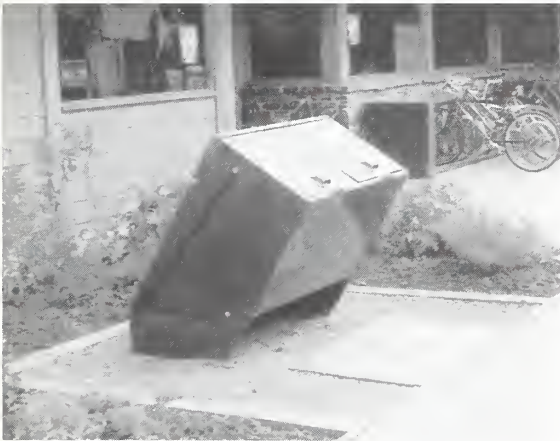


Figure 12. 130 gallon (490 L) Hid-A-Bag II, courtesy McClintock Fabricators, Inc.

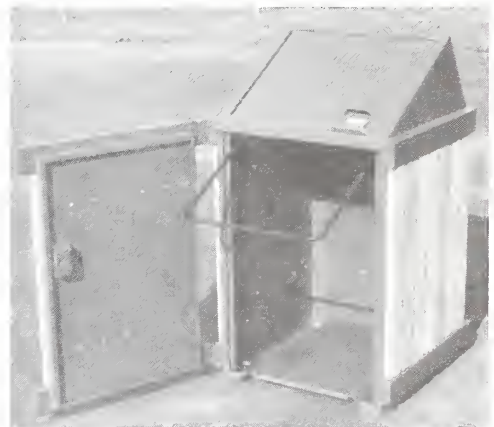


Figure 13. 32 gallon (120 L) Hyd-A-Bag H/A, courtesy of McClintock Fabricators, Inc.



Figure 14. Four-in-One steel container system, Cibola NF.





## DUMPSTERS IN USE TODAY

Dumpsters for garbage disposal are available in a wide range of shapes and sizes and they are the first choice of recreation managers with many sites and contracted garbage collection service.

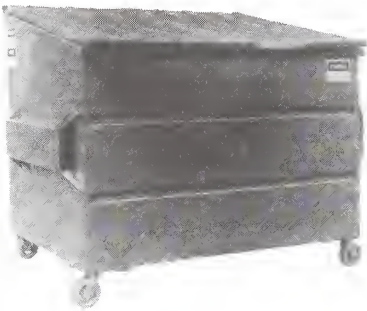


Figure 15. 3 cubic yard (2.3 m<sup>3</sup>) container with plastic lid, courtesy of Capital Industries, Inc.

Dumpster collection systems provide several advantages in solid waste management. Using dumpsters can reduce the time and frequency needed for collection. Automated systems can eliminate the need for lifting containers into collection trucks, ultimately reducing injuries. Air assisted lifts empty the various sized dumpsters into refuse collection trucks.

Some methods of loading garbage from dumpsters into garbage trucks include front-loading, rear-loading, and side-loading. Select dumpsters that meet the individual needs of the customer and the physical site constraints. Careful planning can help in making a decision on which type of garbage collection system is best for the present situation and for future growth. Working with the most commonly used collection methods of today ensures an easier time finding parts and replacement equipment in the future.



Figure 16. 8 cubic yard (6 m<sup>3</sup>) cathedral with skids, courtesy of Capital Industries, Inc.

### Front-Load Dumpsters

Front-end type dumpsters are picked up by two hydraulic forks that lift the dumpsters by side or bottom channels. Dumpsters loaded on garbage trucks without any hand labor, will ultimately reduce costs and minimize injuries and liability. This is the most common dumpster container in the industry today and is quickly replacing the smaller, rear-loading garbage truck. The main drawback of front-end loaders is the vertical clearance needed to operate the lift arms (see figures 15, 16, and 17).

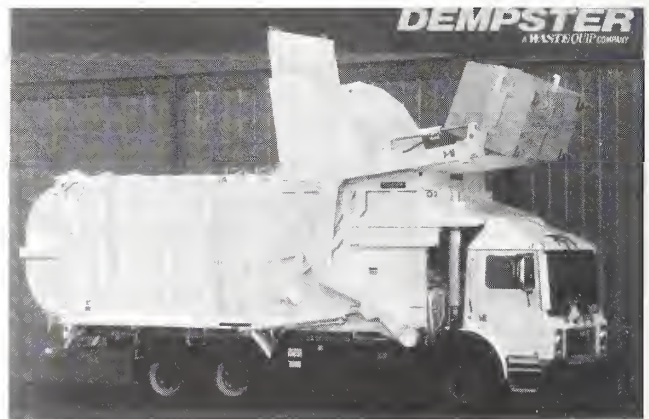


Figure 17. XHD high compaction front loader, courtesy of Dempster Co.

## Rear-Load Dumpsters

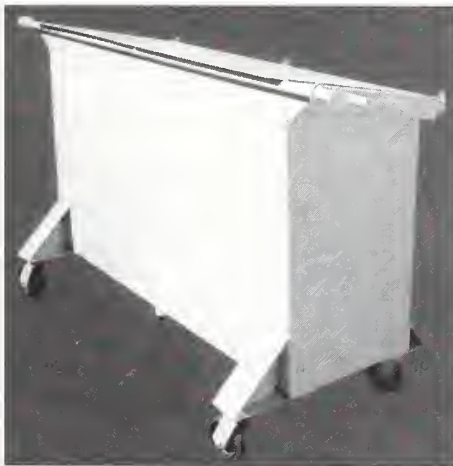
Rear-loading trash trucks require hand labor to roll the waste container to the air assisted lift on the garbage truck. Once the waste container is locked into loading position on the truck, a hydraulic lift bar raises the container and empties the dumpster contents into the garbage truck. (See figures 18, 19, 20, and 21). Containers range in size from one to three cubic yards ( $0.8 \text{ m}^3$  -  $2.3 \text{ m}^3$ ). The smaller sized containers are popular for campground areas that have tight roads and limited head clearance. This type of container and garbage truck is slowly losing industry support because of its small size and the popularity of the front-end loading trucks.



*Figure 18. 2 cubic yard ( $1.5 \text{ m}^3$ )  
dumpster/plastic lid.*



*Figure 19. 3 cubic yard ( $2.3 \text{ m}^3$ )  
slope-front container, courtesy  
Capital Industries, Inc.*



*Figure 20. 1 cubic yard ( $0.8 \text{ m}^3$ )  
rear-load dumpster, courtesy  
Cubic Container Mfg.*



*Figure 21. Rear-Loader, FS.*





## Side-Load Dumpsters

Side-loading containers are also available with air assisted lifts that may require some hand labor to connect air hoses and operate lift controls. Most dumpsters come equipped with polyethylene or very light weight 16 gauge steel lids that offer little or no protection against bears and other animals. Also, accessibility was not a consideration in the overall dumpster design (see figures 22 and 24)

Advantages to the side-load dumpster include the ability of dumping into a garbage truck in a confined space and in one-way traffic situations such as campgrounds and day use areas. Side-load dumpster capacity is similar to that of front-end loader dumpster units.



Figure 22. 1.5 cubic yard (1.1 m<sup>3</sup>) side-load, flat-top container with a metal lid by Capital Industries Inc.



Figure 23. 4 cubic yard (3 m<sup>3</sup>) side-load, slope-top with self-closing doors, courtesy of McClintock/ Haul-All.



Figure 24. 3 cubic yard (2.3 m<sup>3</sup>) side-load slope-front container with a plastic lid by Capital Industries,

The Haul-All semi-automated system is an exception to the average side-load dumpster; this semi-automated system has good access. The Haul-All unit comes as a package; the garbage truck and dumpsters work together. The truck provides air hose hook-ups to facilitate stationary dumpsters and the operator must connect the hydraulic hoses to activate the air lifts. The Haul-All unit is the most accessible side-load unit available. The sloped-front of the container increases accessibility and, with careful planning, minor ramping can accommodate universal access (see figures 23 and 25).



Figure 25. Semi-automated garbage truck and dumpster collection system, courtesy of McClintock/Haul-All.



## ACCESSIBILITY

Waste containers must be located along accessible routes as defined by the Americans with Disabilities Act Accessibility Guidelines (ADAAG) (4.3) and “Universal Access to Outdoor Recreation: A Design Guide”, Chapter IV, (3.3). Containers should be functionally accessible by persons with disabilities. The following functional limitations must be considered when selecting and locating waste containers.

### Height and Reach Limits.

ADAAG lists reach limits for wheelchair users as 48 inches (1.2 m) forward and 54 inches (1.4 m) to the side. These are maximum limits for reaching controls such as light switches that may require little if any strength. For functional activities such as lifting garbage can lids, the functional reach limits may be considerably shorter depending on the design of the garbage container and the specific actions required to deposit the garbage. The Design Guide sets height limits from 15 inches (0.38 m) to 36 inches (0.9 m) above the ground for the opening if approached from the front. Approaching a container from the side allows the usable opening to be from 9 inches (0.2 m) to 36 inches (0.9 m) (see figure 26).

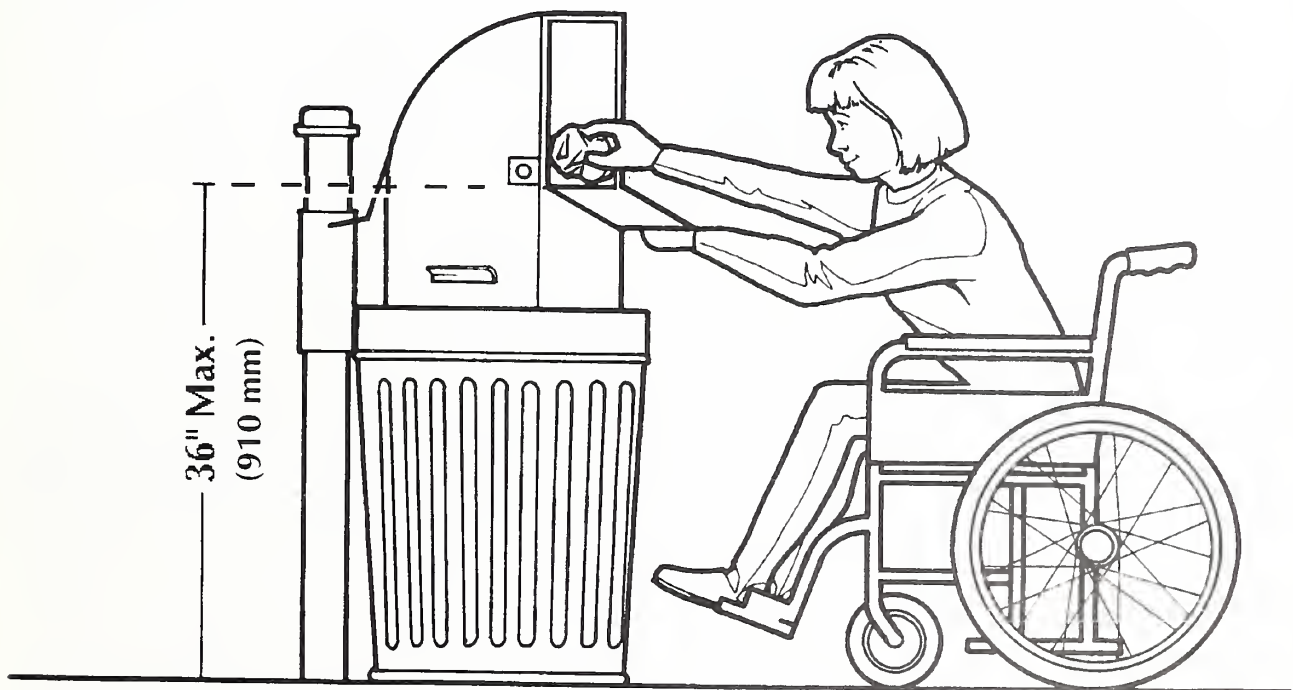


Figure 26. Height limits



## Operating Mechanisms.

There are no specific ADAAG standards for the weight of garbage can lids. However, ADAAG Standards on Controls (4.27.4) and the Design Guide Chapter IV (3.3) state that the force required to open the lid should not exceed five pounds force (22.2N).

Lids manufactured with stainless steel hinges improve operation by preventing the rusting of common steel hinges. The stainless steel hinges facilitate lid operation with one hand without tight grasping, pinching, or twisting of the wrist.

Managers should balance the need for animal resistant garbage containers and the need for accessibility. This is not an easy challenge, specifically where bears are the problem.

Typically, dependence on the general public to close garbage can lids is unrealistic; therefore, self closing lids are the best choice for animal proofing. The standard design most commonly used today by the National Park Service operates like mail box. The design is self-closing and prevents bears from reaching into the cans. The design does require the user to hold the lid open with one hand while depositing the garbage with the other hand. Other styles of self-closing lids also require the use of two hands.



Figure 27. Box type gravity latch.

Box type gravity and spring-loaded latches covered on three sides to keep bear claws out may be difficult to use by persons with long fingernails. Other styles of latches may be more difficult to grasp or operate by persons with some disabilities (see figure 27).

### ***Exceptions to Design Guide Directions***

The following exceptions to the Design Guide directions for trash containers will be proposed to the Architectural and Transportation Barriers Compliance Board for adoption as part of the Developed Outdoor Recreation Accessibility Guidelines. These exceptions have been adopted by the Forest Service and do not apply to any other agency.

1. Lids that are self closing and require two hands for operation are acceptable where large scavenging animals are a problem.

2. Where bears are a problem, exceeding the maximum five pounds force (22.2 N) would be acceptable as long as the pound force (N) is minimized to meet the bear-proofing needs. This will allow the use of heavier gauge steel and other materials to resist damage caused by bears.

3. Different type of latches necessary to prevent small animals and bears from opening lids may cause difficulties with some types of disabilities. This is acceptable provided less restrictive designs are used to meet the local need.

### Exposed Surfaces.

Garbage containers should not have sharp edges that may cause injury to the user. Grind down all edges and corners for steel products.

### Clear Ground Space.

The Universal Design Guide specifies a minimum clear ground space of 36 inches (0.9 m) by 48 inches (1.2 m) in front of the garbage container opening. Position containers for forward or parallel approach. Walkways leading to the waste containers must be a minimum of 32 inches (0.8 m). Adjacent accessible turn-around space required must be beyond the required 32 inch (0.8 m) walkways to accommodate accessibility. When the garbage container is located adjacent to a vehicle road, a minimum of 36 inches (0.9 m) of clear ground space must be provided between the garbage container and the road edge. To ensure safety, provide a wider space along road edges. For forward approaches, a distance greater than 48 inches (1.2 m) is necessary for safety (see figure 28).

### Dumpsters

There are no specific guidelines provided by ADAAG or the Design Guide for dumpsters. Managers should select and locate dumpsters to facilitate access. Several ideas on dumpster top design will be discussed later. Some available dumpsters include smaller lids for depositing garbage directly into the container. These small lids rest on top of larger lids that are one half the size of the dumpster. The larger lids swing open when dumped into a garbage truck. The small lids are lighter and easier to use by visitors. The smaller lids are usually one-third the size of the larger one-half lids and are in many cases latched or at least lockable.

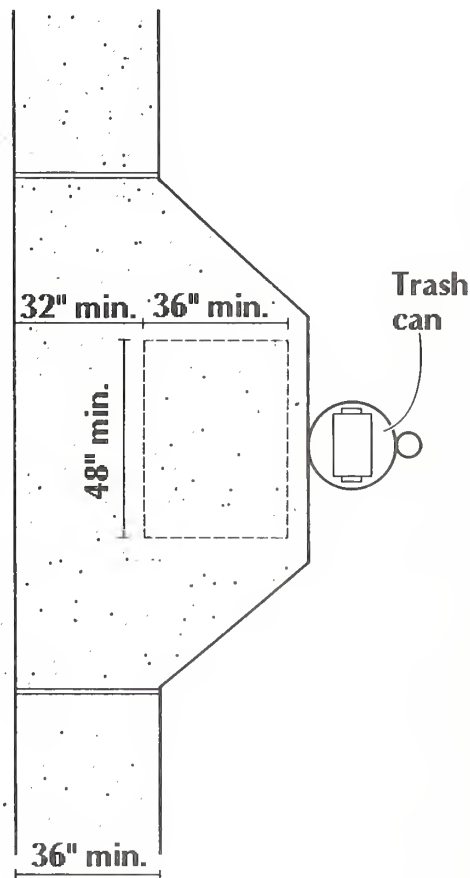


Figure 28. Clear space for access.





---

Dumpsters are designed to maximize capacity. This design creates problems for access due to the height of many containers. It may be possible to design and construct a ramp to provide functional access to a dumpster by a wheelchair user or a person of short stature. Careful planning must be exercised to prevent user conflicts when designing ramps and access routes for the user. Conflicts can arise when trying to meet vehicular and pedestrian access to the dumpsters.

It is crucial to have a good understanding of how the dumpsters will be used by the public, and what special traffic designs will be required to accommodate the garbage trucks needs. The site design should accommodate traffic access, egress, and turning radii needs for loading garbage with a minimum of impact on the site user.

**NOTE:**

***For additional information on current accessibility projects  
contact William Makel, Program Leader, Recreation  
(909) 599-1267 DG:W07A or Chuck Frayer (503) 326-3644 DG:R06C***

---

## **ANIMAL RESISTANCE IN WASTE CONTAINERS**

The main objective in searching for an animal resistant waste container is to keep wildlife out of the garbage containers. It is important that the containers be cost effective, safe to both the user and the animals, and be aesthetically pleasing.

Preventing injury to humans and wildlife is paramount in selecting, designing, or modifying waste containers. To prevent injury to humans or wildlife, select products and materials with care. That means no sharp edges or extensions that would cause any type of lacerations, cuts or bruises. Design tight joints to minimize the possibility of damage to the unit as well as claw or tooth breakage to wildlife.

Most animal-proof waste containers available today are modified garbage cans and dumpsters made from metal, wood, plastic, and recycled plastic products. The weakest part of the typical container has traditionally been the lid. Most manufacturers do not spend much time designing animal-proof lids especially for bear disturbance problems. These problems are relatively minor in comparison to the large number of containers sold in the nation.

Garbage container equipment in use today is designed primarily for the urban setting. In most cases these containers work adequately well for garbage collection and containment against small animals. Waste containers designed for the urban environment do not adequately meet the needs of the field recreation manager to keep out bears, coyotes, raccoons, and other large, medium and some small animals.

### **Criteria for Selecting an Animal Proof Garbage Container**

The following are some important items to consider when looking for animal resistance in waste containers. Sizes vary from the standard 32 gallon (120 L) garbage can to various dumpster sizes.

#### ***Container Security***

Container security means making certain that the container will not be dumped, tipped, hauled off and dented or damaged by bears or other animals while in operation. Less container spillage translates directly into lower overall maintenance costs. Containers must be restrained and stabilized in a level position to prevent the container from being tipped or dumped.

Secure small containers by using a standpipe or attaching the garbage container to a level, hard material surface with fasteners or tie downs. Construct a level base by using concrete, asphalt, or other materials such as wood, recycled plastic timbers or planks spiked or



anchored to the ground. Pipe stands are available from several vendors that can accommodate one or more cans. Stand pipe units are helpful in preventing containers from being knocked down by smaller animals. Figure 29 shows a standard 32 gallon (120 L) container with a bear-proof lid on a concrete surface. The container is held in place by a standpipe and a heavy lid to prevent bears and other animals from knocking the container over. At the base a culvert pipe keeps the container from being knocked-out from under the lid.



*Figure 29.*  
32 gallon (120 L) container with a  
bear-proof lid on a concrete pad.

Dumpster security can mean providing a heavy gauge steel lid that can withstand the weight of a 500 pound (227 kg) adult black bear. Using 12 or 10 gauge steel should prevent bears from crushing the lids. Black bears also push over the waste containers to spill the garbage. The spillage problem can be solved by providing 3/8 inch (9.5 mm) steel rod tie down loops with a minimum opening of 1 1/2 inches (38 mm) affixed to opposite corners at the base of the container (see figure 30). A heavy duty cable or chain that is both flexible and lockable attaches the can to a concrete footing. The chain must have links large enough to accommodate a typical key lock. The tie down material must be flexible enough to be tightened to remove all slack when in the tied position.



*Figure 30. Chain tie down loop.*





Figure 31.  
Weather resistant container.

### ***Weatherproof Lids.***

Lids should be weather-tight whenever possible. Weatherproofing of dumpsters and other containers is important in keeping out snow and rain; thereby reducing maintenance and excessive weight. Drainage holes at the bottom of dumpsters can help reduce water problems. A 1 1/2 inch (38 mm) hole with a screw type plug should be sufficient to provide adequate drainage for a dumpster on a level surface. Liquids from food and drink develop into strong odors that are attractants to bears. Figure 31 shows the NPS bear-proof lids that have worked well in the past for weather resistance.

### ***Latches***

Containers should be self-latching, if possible, to reduce reliance on visitors to close the lids. Box type gravity or spring operated latches have been developed by manufacturers and work very well for bear-proofing. The Haul-All Hyd-A-Bag model box latch has a bear claw-guard feature that does not allow a bear to insert its claws inside the box latch.

Box type gravity latches may restrict use by persons with long fingernails because fingers must be inserted into the box latch palm-side-up and the fingernails press against the gravity or spring loaded release mechanism. Remember that universal access must be kept in mind when looking at latches or latch equipped garbage containers.

Latches should allow the user to place a minimum of three fingers on the latch for ease of use depending on the weight of the door. One-finger ring latching mechanisms and two-finger "T" type hardware is inadequate for use as latches for garbage cans and dumpsters. Simple grab handles are available for areas that do not have bear problems. If the bears can get a hold on a grab handle they will in most cases tear the lids off or break the handle. Other latches that require fine motor coordination with the use of one or several fingers are also inadequate for universal access use (see figures 32, 33, 34, and 35).



Figure 32. Box type latch.



## **Hinges**

Stainless steel hardware is desirable for mechanical moving parts, especially hinges, whenever possible. Hot dipped galvanized steel parts can also be used. Not using stainless or galvanized moving parts can mean rusted, frozen equipment and an increase in the degree of difficulty for the user trying to move rusted parts against each other. The pound force (N) required for universal access will increase, making it more difficult for persons with hand impairments.

## **Waste Container Fabrication Materials**

Most waste containers are manufactured from galvanized steel, welded or riveted together to provide a light weight, weather resistant product. Smaller and stronger containers may be fabricated by a stamping process that adds ribs to an otherwise smooth sheet of steel.

## **Finishes**

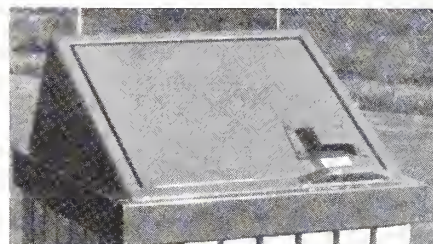
The style and finish of a waste container should reflect the design theme of the site whenever possible. The overall design of the container should complement the other furnishings found on the site, (i.e., round versus square, galvanized versus painted).

In some cases a galvanized container may be adequate to meet customer needs. In other cases a painted finish on a galvanized container may be perfectly adequate to do the job. If the galvanized container is to be painted, the surface of the container must first be treated with an etching agent like 'Galvawash' (or a similar product) which allows the paint to adhere to the galvanized surface.

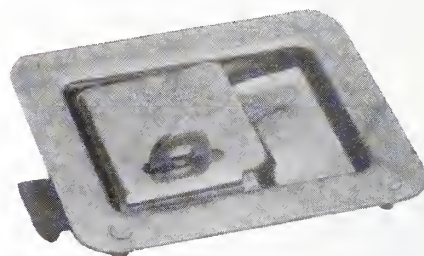
Some manufacturers offer painted waste container models only. Choose the toughest industrial grade paint system for a waste container finish. Manufacturers generally offer more than one option both for the type of paint system and the color that may be required for a specific site. A paint system may include a tough primer with one or two coats of paint. If possible, include the paint system specification requirements when submitting the purchase order, otherwise, try to include the specifications in the site development plan. For small waste containers and dumpsters that have a painted finish, a durable paint system will provide a long lasting protective coat. A good paint job will provide a good appearance during the life of the container. Dupont's Imron 333 Polyurethane enamel is a good choice for a long lasting finish with good color retention. Other companies may have similar products for this type of tough paint application.



*Figure 33.  
Paddle type spring-loaded  
lockable latch.*



*Figure 34. Box type latch with bear-  
claw guard McClintock Metal  
Fabricators.*



*Figure 35. Lockable paddle handle  
slam latch.*



---

## SELECTION AND COST

### Can-Type Bear Proof Containers

Available models of can-type containers, in 32 to 55 gallon (120 L-210 L) sizes, require animal resistant lids in 12 or 10 gauge cold rolled steel. The heavier material can support the crushing weight of a bear. Lighter gauge steel may be used if it is properly reinforced. In addition to the lids, a stand-pipe for the container helps to keep the container stable and level on the ground. The extra weight of a modified lid requires a pipe stand for additional support to hold up the can. In some cases the lids may actually weigh more than the can it is covering. Use a steel base or basket 2 to 3 inches (50 mm-80 mm) off the ground to maintain the can upright and level. This eliminates the need for a concrete or an asphalt pad and saves time and money.

The National Park Service has used the bear-proof lid cover shown in figure 36 successfully for a number of years.



*Figure 36.*  
NPS bear proof lid on 32 gallon  
(120 L) container. \$400.00.

Bear-proof containers available from McClintock Fabricators, Inc. are shown in figures 37 and 38. Both these models are made from 12 gauge galvanized steel and coated with a durable polyurethane coating. The Hyd-A-Bag models allow for rear door unloading. This does not require heavy upward lifting of full bags of garbage. The containers are user-friendly and have a covered latch for bear-proofing. Hinges and latches are made with stainless steel for a long life of maintenance free use. The Hyd-A-Bag I and II are available in 70 gallon (260 L) and 130 gallon (490 L) capacity. A new model recently introduced is shown in figure 39. It is basically the same as Hyd-A-Bag Mini 2-32 gallon (2-120 L) size capacity, however, it was designed to accommodate universal access.







Figure 37. Hid-A-Bag Mini 32 gallon (120 L) Model HB1G (\$550), courtesy of McClintock Fabricators, Inc.



Figure 39. Hyd-A-Bag Model HB2GU accessible animal-proof container for 2-32 gallon (2-120 L) bags, courtesy of McClintock Fabricators, Inc.

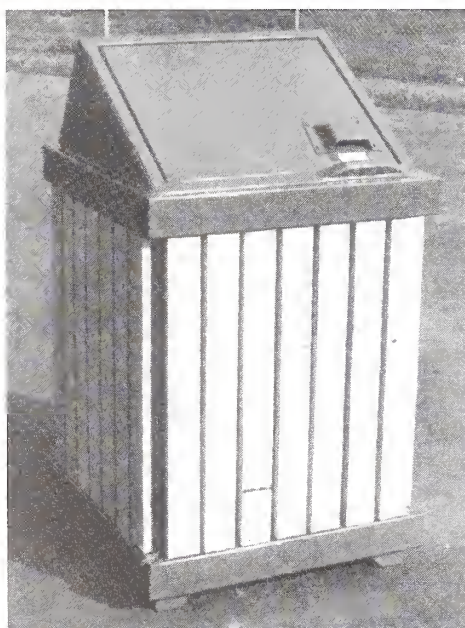


Figure 38. Hyd-A-Bag H/A (\$710), courtesy of McClintock Fabricators, Inc.



Figure 40. Tioga-32 gal. (120 L) courtesy of McClintock. Call for current pricing.

Figures 40 and 41, 32 gallon (120 L) bear proof container lids, Model REC32-A were developed as a hybrid of the NPS bear-proof container. The container is very difficult to lift and twist to the side of the stand-pipe it rests on to empty the bags. SDTDC developed a model made with 10 gauge steel which has an accessible box type latch that protects it from bear disturbance. This model allows maintenance personnel to lift the lid with a leverage pipe handle to open the hinged top. Once the lid is out of the way the maintenance person can empty the garbage bag and lower the lid back to a lockable position. The lid is designed for a standard 32 gallon (120 L) container.

#### **Small Animal-proof container/recycling system.**

The Cloverleaf system is an attempt to provide an affordable animal resistant, universally accessible recycling and waste containment system using the 32 gallon (120 L) garbage container. The basic design utilizes 3-32 gallon (3-120 L) garbage containers mounted on a central post. The design maximizes the space utilized and provides an easy to use garbage and recyclable collection system. Each container mounts on a support base that is welded to a post. An attachment bolt is inserted into a slot in the support post to secure the container with a steel cap and a lock. The post is installed into a sleeve and bolted for easy removal and maintenance.

The animal proof lids are mounted on each can and attached to the central support post securing the containers from bear disturbance. The garbage can lids are made with 12 and 10 gauge cold rolled steel, painted with Dupont 333 Imron Polyurethane paint for a long lasting finish.



*Figure 41. SDTDC 32 gallon (120 L) heavy duty bear-proof lid, test model at Sequoia NF.*



*Figure 42. SDTDC 3-32 gallon (120 L) Cloverleaf System, one of three containers on a central stand with latch or no latch option, (currently for small animals only). Experimental.*







*Figure 43. Cloverleaf Garbage Container System with stainless slam paddle latches and recycling capability. Experimental model.*

Inside, the garbage bag is held in place by a steel ring. To replace the bag, lift the ring, remove the bag, and replace it with a clean bag. The garbage bag wraps around the ring and is held in place by the weight of the steel ring (see figures 42 and 43 for the Cloverleaf Garbage Container System).

Latching mechanisms can vary depending on the type of unit needed. Choices may include no latches for areas where only small animals are a problem, simple paddle latches for medium sized animals, and lockable paddle latches for recycling situations where security may be needed to keep recyclables from being removed. (See figure 44.)



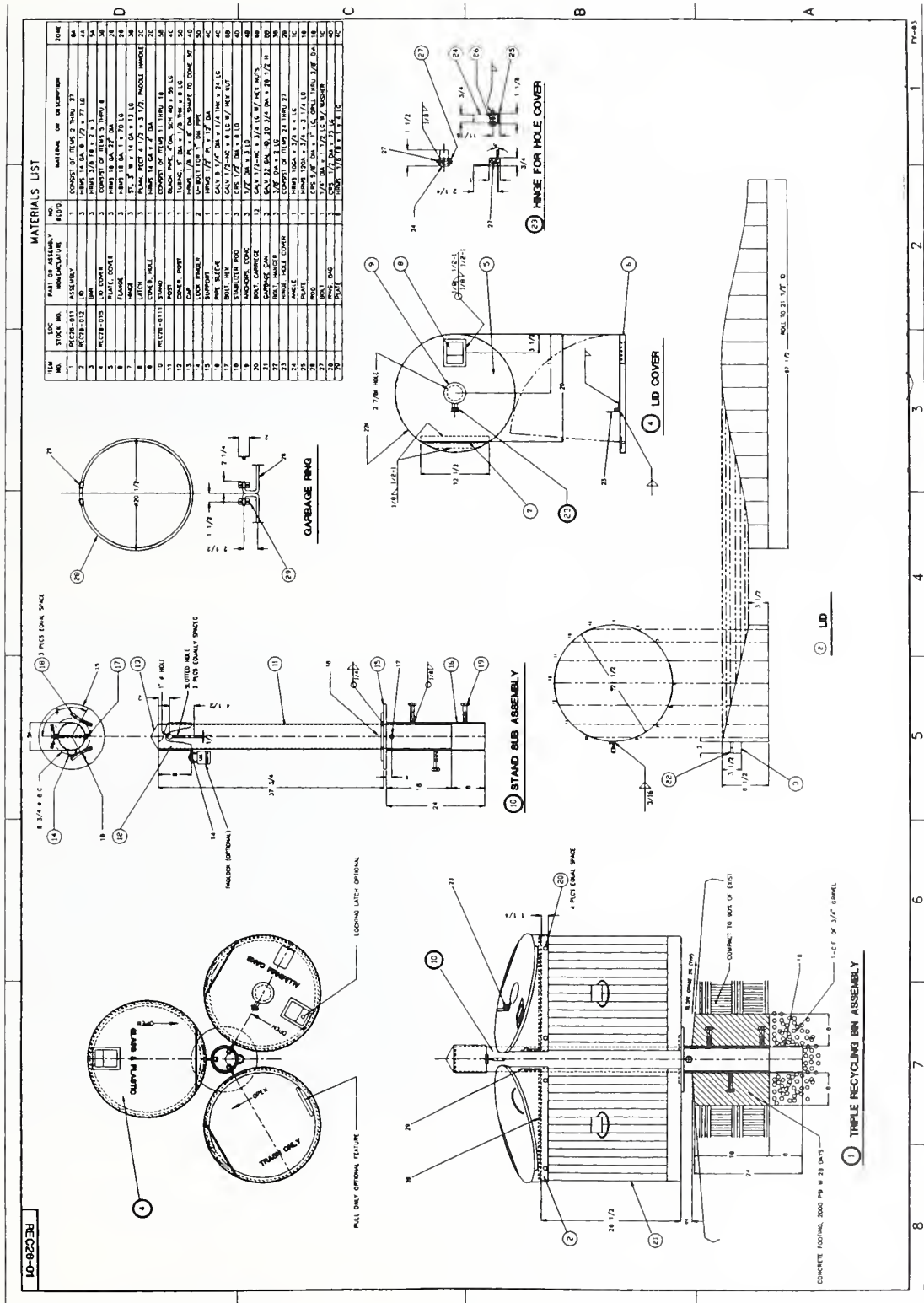


Figure 44. CAD drawing of the Cloverleaf Garbage Container System.

## Bear-Proof Dumpsters

Depending on the nature of the bear problem, dumpster manufacturers can build dumpster sized containers with 12 or 10 gauge bottoms and 14 or 12 gauge steel lids. For maintenance purposes, the lids are designed in two parts to reduce the overall weight. Rear-loading garbage trucks require the operator to exit the vehicle and connect the garbage dumpster to the rear of the truck. Two half lids reduces the weight and allows maintenance personnel to lift the doors with less effort. Smaller customer access doors on each half of the lid facilitates garbage disposal by the public. Smaller doors also allow universal access for the general public when requirements for height are met (see figures 48, 49, 50, 52, and 53).

Dumpsters should be lockable with a chain on lock rings at opposite corners to keep the containers from being tipped. Providing a flat hard durable surface for the dumpsters is also very important to keep the waste container from sinking in soft or wet soil conditions.

The following photos are examples of different sized experimental containers that the center has developed and is currently testing (see figures 45, 46, and 47).



*Figure 45. 1.5 cubic yard (1.1 m<sup>3</sup>) rear-load bear-proof container. Manufactured by Cubic Container for SDTDC. Experimental model, front view, container has small self latching doors on a cover lid. \$500.00.*



*Figure 46. 1.5 cubic yard (1.1 m<sup>3</sup>) container, rear view with lockable top and rings at the base for locking to a tie down.*



Figure 47. 4 cubic yard ( $3 \text{ m}^3$ ) bear-proof front-end load garbage container by Cubic Container Manufacturing for SDTDC, experimental model. \$475.00



Figure 48. Front-load bear-proof dumpster with mailbox design top, Yosemite NP by Capital Industries, Inc. 4 cubic yard ( $3 \text{ m}^3$ )—\$1125.00.



Figure 49. Front-load container with bear-proof lids by Capital Industries, Inc. 4 cubic yard ( $3 \text{ m}^3$ )—\$1125.00.



Figure 50. Rear-load container with a bear-proof lid by Capital Industries, Inc. See prices Table 1.



Table 1. Capacity and price list for rear-load bear-proof containers by Capital Industries, Inc.

| Capacity                                  | Price \$ | Ship Weight lbs/kg |
|---|----------|--------------------|
| 1 yd <sup>3</sup> (0.8 m <sup>3</sup> )   | 465.00   | 370 lbs (168 kg)   |
| 1.5 yd <sup>3</sup> (1.1 m <sup>3</sup> ) | 550.00   | 385 lbs (175 kg)   |
| 2 yd <sup>3</sup> (1.5 m <sup>3</sup> )   | 615.00   | 440 lbs (200 kg)   |
| 3 yd <sup>3</sup> (2.3 m <sup>3</sup> )   | 920.00   | 560 lbs (254 kg)   |

Table 2. Capacity options and prices for 'Lodal' containers by Capital Industries, Inc. (See figure 51 for example).

| Capacity yd <sup>3</sup> /m <sup>3</sup><br>(Single Point Lodal) | Price \$ | Ship Weight lbs/kg |
|--|----------|--------------------|
| 4 yd <sup>3</sup> (3 m <sup>3</sup> )                            | 1650.00  | 720 lbs (327 kg)   |
| 6 yd <sup>3</sup> (4.6 m <sup>3</sup> )                          | 1850.00  | 1170 lbs (531 kg)  |



Figure 51.  
'Lodal' Bear-Proof containers  
by Capital Industries Inc.  
See Table 2 (p26) for pricing.



Figure 52. 4 cubic yard (3 m<sup>3</sup>) Hyd-A-Way  
bear-proof container with a self closing door,  
courtesy of McClintock/Haul-All. Call for current pricing.



Figure 53. Hyd-A-Way being emptied  
into hauling truck with a hydraulic lift,  
courtesy of McClintock/Haul-All.  
Call for current pricing.



Figure 54 shows available custom fitted bear-proof dumpster lids from McClintock Fabricators, Inc. The lids are designed to suit individual needs based on the type of container the customer is currently using. The lid hinges and latches are manufactured with stainless steel hardware for rust free performance. The overall lid is manufactured with 12 gauge galvanealed steel and coated with a polyurethane long lasting finish. Standard color is olive green. The finish resists humidity, salt spray, fog, ultraviolet light, abrasion, and chemicals. The finish is also resistant to graffiti. Small customer garbage deposit doors, 16 inch (0.4 m) wide x 20 inch (0.5 m) high and 32 inch (0.8 m) wide x 20 inch (0.5 m) high, have gravity activated latches. The doors are recessed to prevent bears from accessing the latch.

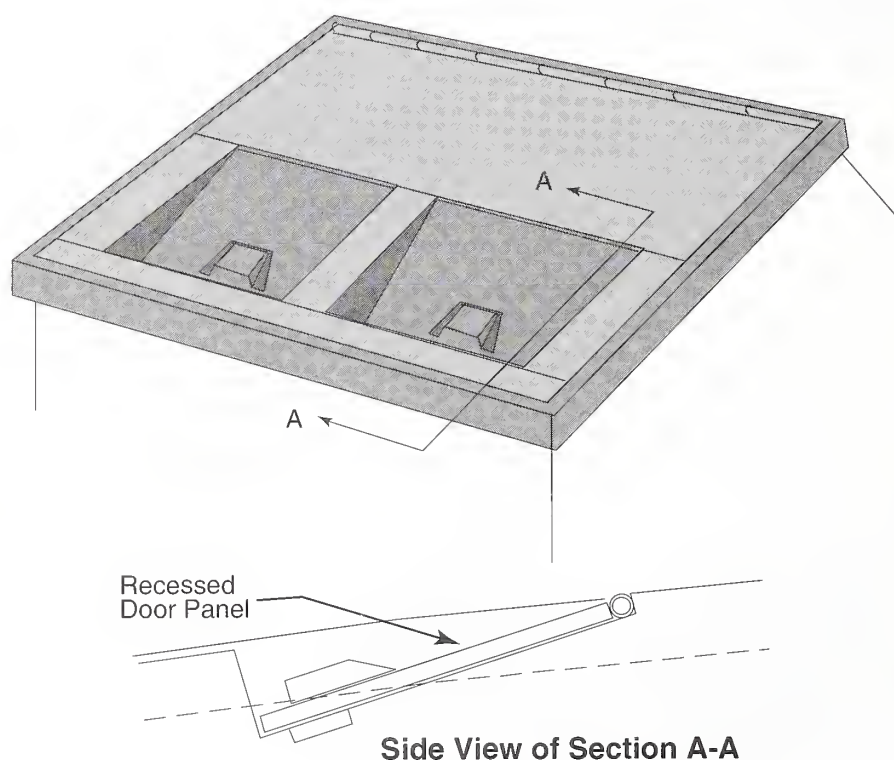


Figure 54. Custom bear-proof dumpster lids from McClintock Fabricators, Inc.



## SUMMARY

In the final analysis there are many waste container manufacturers, but only a few that specialize in bear-proofing. Animal-proofing garbage containers will continue to be a challenge in the Forest Service and at other agencies in the future. Our best answer to this problem is to continue to explore new low cost technologies that are introduced by industry now and in the years ahead.

New innovation and technological improvements in fabrication materials including metal alloys, rust protection in metal coatings, advanced paint systems, and faster fabrication techniques can help towards the development of a better garbage container system.

The ultimate challenge is to develop a product that will offer the perfect solution for animal resistance, accessibility, low cost, and low maintenance. To meet these and future challenges, good old human ingenuity is still the best way to tackle many of the problems that face us now and in the future to provide better service for our Forest Service customers.

---

## LIST OF MANUFACTURERS

### **Capital Industries, Inc.**

5801 Third Ave. South  
Seattle WA 98108.  
Telephone (206) 762-8585

### **Cubic Container Manufacturing (dumpsters and lids)**

11619 Pendleton Street  
Sun Valley CA. 91352  
Telephone (818) 504-0722

### **McClintock Metal Fabricators, Inc.** (containers, dumpsters and hauling equip.)

455 Harter Avenue,  
Woodland, CA 95776  
Telephone (916) 666-6007  
*Note: (Representative for Haul-All Equipment Systems.)*

### **Sonoma County Probation Camp**

6201 Eastside Rd.  
Forestville, CA 95436  
Telephone (707) 527-1108

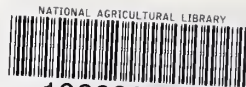


1022385921



Printed on recycled paper





1022385921

